Econ435–Financial Markets and the Macroeconomy
Summer II 2007
Final exam

The exam consists of 30 multiple choice questions and 4 short-answer questions. Please answer ALL of them. There is also one extra credit question. If you have the time, you can attempt it and earn bonus points.

The duration of the exam is 2 hours. DO NOT OPEN the exams until you are told to do so and STOP writing when you are told that the exam is over. **Failure to comply will result in a 10% loss in the grade.**

Do not forget to write (and bubble) your name and university ID number on the scantron.

NO PROGRAMMABLE OR FINANCIAL CALCULATORS ARE ALLOWED. Only simple or scientific calculators can be used.

GOOD LUCK!

1. Which of the following statements is **false** about risk-averse individuals:
   A) They require a positive risk-premium.
   B) They evaluate risky projects based only on expected returns.
   C) They prefer higher risk projects to lower risk projects.
   D) Both B and C.

2. An example of a derivative security is _____.
   A) a common share of General Motors
   B) a call option on Mobil stock
   C) a commodity futures contract
   D) B and C
   E) A and B

3. The term, "arbitrage" refers to
   A) buying low and selling high.
   B) short selling high and buying low.
   C) earning risk-free economic profits.
   D) negotiating for favorable brokerage fees.
   E) hedging your portfolio through the use of options.

4. Suppose you held a well-diversified portfolio with a very large number of securities, and that the single index model holds. If the σ of your portfolio was 0.18 and σ_M was 0.22, the ß of the portfolio would be approximately _____.
   A) 0.64
   B) 1.19
   C) 0.82
   D) 1.56
   E) none of the above

5. A 20-year municipal bond is currently priced to yield 7.2%. For a taxpayer in the 33% marginal tax bracket, this bond would offer an equivalent taxable yield of:
   A) 8.20%.
   B) 10.75%.
   C) 11.40%.
   D) 4.82%.
   E) none of the above.

6. According to the Capital Asset Pricing Model (CAPM),
   A) a security with a positive alpha is considered overpriced.
   B) a security with a zero alpha is considered to be a good buy.
   C) a security with a negative alpha is considered to be a good buy.
   D) a security with a positive alpha is considered to be underpriced.
   E) none of the above.

7. Given an optimal risky portfolio with expected return of 12% and standard deviation of 26% and a risk free rate of 3%, what is the slope of the best feasible CAL?
   A)   0.64
   B)   0.14
   C)   0.08
   D)   0.35
   E)   0.36

8. The weak form of the efficient market hypothesis contradicts
   A)   technical analysis, but supports fundamental analysis as valid.
   B)   fundamental analysis, but supports technical analysis as valid.
   C)   both fundamental analysis and technical analysis.
   D)   technical analysis, but is silent on the possibility of successful fundamental analysis.
   E)   none of the above.

9. The potential loss for a writer of a naked call option on a stock is
   A)   limited.
   B)   unlimited.
   C)   larger the lower the stock price.
   D)   equal to the call premium.
   E)   none of the above.

10. Your client, Bo Regard, holds a complete portfolio that consists of a portfolio of risky assets (P) and T-Bills. The expected return on the risky portfolio P is 12%, its standard deviation is 7.20%, and the risk-free rate of return is 3.60%. Bo's complete portfolio is has weights equal to 80% for the risky portfolio P and 20% for T-Bills.
   What is the slope of Bo's Capital Allocation Line?
   A)   3.6
   B)   1.167
   C)   12.0
   D)   0.2
   E)   0.857

Use the following to answer question 11:

Consider the following graph showing the indifference curves of John and Tom.
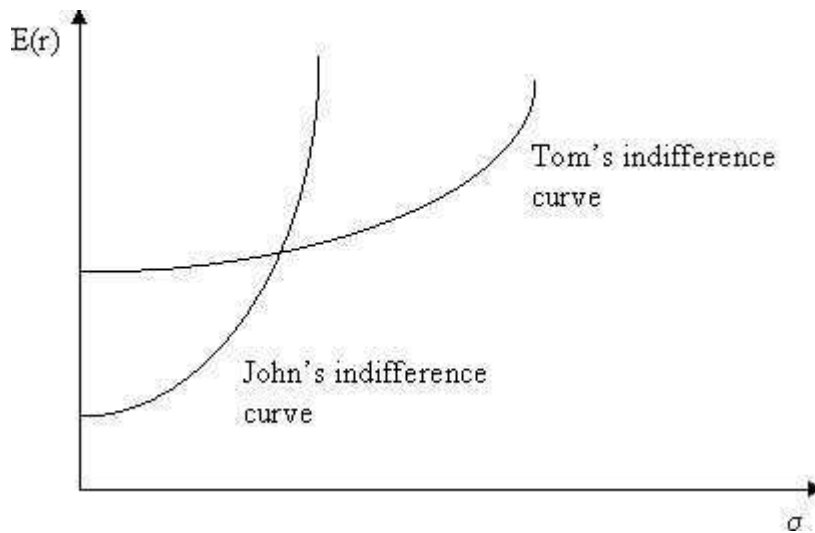
11. Which of the following statements is **true**:
   A)   Tom is more risk-averse than John.
   B)   John is more risk-averse than Tom.
   C)   Tom is as risk-averse as John.
   D)   John is a risk-lover.
   E)   No comparison between John and Tom can be made based on the information provided.

12. If you believe in the _____ form of the EMH, you believe that stock prices reflect all available information, including information that is available only to insiders.
   A)   semistrong
   B)   strong
   C)   weak
   D)   all of the above
   E)   none of the above

13. Proponents of the EMH think technical analysts
   A)   should focus on relative strength.
   B)   should focus on resistance levels.
   C)   should focus on support levels.
   D)   should focus on financial statements.
   E)   are wasting their time.

14. If the stock price increases, the price of a put option on that stock _____ and that of a call option _____.
    A) decreases, increases
    B) decreases, decreases
    C) increases, decreases
    D) increases, increases
    E) does not change, does not change

15. You purchase one IBM March 100 put contract (i.e., the exercise price is $100 per share) for a put premium of $6. What is the maximum profit that you could gain from this strategy?
    A) $10,000
    B) $10,600
    C) $9,400
    D) $9,000
    E) none of the above

16. Security A has an (actual) expected rate of return of 10% and a beta of 1.1. The market expected rate of return is 8% and the risk-free rate is 5%. The alpha of the stock is
    A) 1.7%.
    B) -1.7%.
    C) 8.3%.
    D) 5.5%.
    E) none of the above.

17. The standard deviation of a portfolio that has 30% of its value invested in a risk-free asset and 70% of its value invested in a risky asset with a standard deviation of 30% is ____%.
    A) 18
    B) 14
    C) 21
    D) 24
    E) 20

18. You sold short 150 shares of common stock at $27 per share. The initial margin is 45%. Your initial investment was
    A) $4,800.60.
    B) $12,000.25.
    C) $2,250.75.
    D) $1,822.50.
    E) none of the above.

19. A _____ portfolio is a well-diversified portfolio constructed to have a beta of 1 on one of the factors and a beta of 0 on any other factor.
   A)   factor
   B)   market
   C)   index
   D)   A and B
   E)   A, B, and C

20. The maximum loss a buyer of a stock call option can suffer is equal to
   A)   the strike price minus the stock price.
   B)   the stock price minus the value of the call.
   C)   the call premium.
   D)   the stock price.
   E)   none of the above.

21. A disadvantage of using stock options to compensate managers is that
   A)   it encourages mangers to undertake projects that will increase stock price.
   B)   it encourages managers to engage in empire building.
   C)   it can create an incentive for mangers to manipulate information to prop up a stock price temporarily, giving them a chance to cash out before the price returns to a level reflective of the firms true prospects.
   D)   all of the above.
   E)   none of the above.

22. The global minimum variance portfolio formed from two risky securities will be riskless when the correlation coefficient between the two securities is
   A)   0.0
   B)   1.0
   C)   0.5
   D)   -1.0
   E)   negative

23. A stock option has an intrinsic value of zero if the option is
   A)   at the money.
   B)   out of the money.
   C)   in the money.
   D)   A and C.
   E)   A and B.

24. A security has an expected rate of return of 13% and a beta of 2.1. The market expected rate of return is 9% and the risk-free rate is 4.5%. The alpha of the stock is
   A)   -0.95%.
   B)   -1.7%.
   C)   8.3%.
   D)   5.5%.
   E)   none of the above.

25. A European call option allows the buyer to
    A)   sell the underlying asset at the exercise price on the expiration date.
    B)   buy the underlying asset at the exercise price on or before the expiration date.
    C)   sell the option in the open market prior to expiration.
    D)   buy the underlying asset at the exercise price on the expiration date.
    E)   C and D.

26. Assume that a security is fairly priced (i.e., CAPM holds) and has an expected rate of
    return of 13%. The market expected rate of return is 13% and the risk-free rate is 4%.
    The beta of the stock is ___?
    A)   1.25
    B)   1.7
    C)   1
    D)   0.95
    E)   none of the above.

27. With regard to a call option contract on a stock, the long position is held by
    A)   the trader who bought the contract at the largest discount.
    B)   the trader who has to travel the farthest distance to deliver the stock.
    C)   the trader who plans to hold the contract for the lengthiest time period.
    D)   the trader who has the right to purchase the stock on the delivery date.
    E)   the trader who commits to selling the stock on the delivery date.

28. You sold short 100 shares of common stock at $45 per share. The initial margin is 50%.
    At what stock price would you receive a margin call if the maintenance margin is 35%?
    A) $50
    B) $65
    C) $35
    D) $40
    E)   none of the above

29. In a well diversified portfolio
    A)   market risk is negligible.
    B)   systematic risk is negligible.
    C)   unsystematic risk is negligible.
    D)   nondiversifiable risk is negligible.
    E)   none of the above.

30. Buyers of put options anticipate the value of the underlying asset will _____ and
    sellers of call options anticipate the value of the underlying asset will _____.
    A)   increase; increase
    B)   decrease; increase
    C)   increase; decrease
    D)   decrease; decrease
    E)   cannot tell without further information

Question 1

Briefly explain the following:

(i) the concept of diversification and how it can help reduce the risk of a portfolio. Make sure to explain which types of risk can and cannot be eliminated through diversification and why.

(ii) why selling short is "more risky" than buying on margin. Also remember to describe how each of these transactions works.

(iii) why buying options is more risky than buying stock.

(iv) the concept of arbitrage. Also give an example of an arbitrage opportunity and describe how the market would eliminate it.

(v) how the strike price influences the premium of a put and of a call option.

(vi) the semi-strong version of the efficient market hypothesis and how it invalidates (or not) technical and fundamental analyses, which you should also define.

Question 2

There are three assets on the market: a corporate bond that offers an interest rate $r_b = 8\%$, a municipal bond with an interest rate $r_m = 5\%$ and a stock with an expected return $E(r) = 10\%$.

(i) When asked to choose between the corporate bond and the stock, which one would a risk-neutral investor pick (assume the tax on interest and on stock-market earnings is the same)? Justify your answer.

(ii) In what tax bracket should be an investor who is indifferent between municipal bond and the corporate bond?

(iii) Calculate the equivalent taxable yield for an investor facing a 20% tax rate. Which of the two bonds would he or she choose?

Question 3

Stocks A and B have expected returns equal to $E(r_A) = 6.6\%$ and $E(r_B) = 8.6\%$ respectively. Their covariances with the return on the market portfolio are $Cov(r_A, r_M) = 90$ and $Cov(r_B, r_M) = 140$. (Note: be careful if you want to work with decimals rather than percentages.) The variance of the return on the market portfolio is $\sigma_M^2 = 100$.

(i) What are the beta coefficients for stocks A and B?

(ii) Using the CAPM model for the two stocks, calculate the risk-free rate and the expected return on the market portfolio.

(iii) Portfolio P is constructed by combining stocks A and B with weights $w_A = 0.8$ and $w_B = 0.2$. What are the expected return and the beta of the portfolio?

(iv) Suppose you have some information that makes you believe the return on stock A should actually be $E^a(r_A) = 8\%$ and the return on stock B should be $E^a(r_B) = 8\%$. What are the alpha coefficients for the two stocks? Are they overpriced, underpriced or fairly priced? How would you take advantage of any mispricing you found?

Question 4

Stock A currently sells for $30 a share and the ongoing (risk-free) interest rate is 4%.

(i) Suppose you wanted to construct a covered call by buying stock and selling a call option with maturity in six months, strike price $X = \$32$, and premium $C = \$3$. Derive and graph the payoff and the profit from this investment strategy. When would you want to pursue such an investment?

(ii) Now suppose you wanted to construct a protective put by buying stock and buying a put option with the same characteristics as the call option in the previous part. What would be the premium on this put option? Derive and graph the payoff and the profit from this investment strategy. When would you want to pursue such an investment?

Extra Credit Question

Consider the CAPM model.

(i) Define the separation property and describe the "optimal" risky portfolio that all investors would choose.

(ii) What is the Security Market Line? Which assets does it plot? Write down its equation.

(iii) Explain how one would use the CAPM model to find underpriced securities. (Do not forget to show how to calculate the *alpha* of a security.)

(iv) Explain the differences between the Security Market Line and the Capital Market Line and why they use different measures of risk.